

28031

Cruise Report

ATLANTIS II 103

28 Sept. - 5 Oct. 1978

**Brad Butman
U. S. Geological Survey
Woods Hole, MA 02543**

Vessel: R/V ATLANTIS II

Cruise Number: AII 103

Area of Operations: Middle Atlantic Bight and Georges Bank

Dates: Depart Woods Hole, MA 1030 23 Sept. 1978

Arrive Woods Hole, MA 1900 5 Oct. 1978

Personnel:

David Cassiles	Master, ATLANTIS II
Brad Butman	Chief Scientist, USGS
C. Bryden	U. S. Geological Survey
C. Deadmon	" " "
T. Dourdeville	Woods Hole Oceanographic
A. Eliason	Eliason Data Services
N. Lillard	U. S. Geological Survey
M. Noble	" " "
C. Parmenter	" " "
S. Pfirman	" " "
J. Ratcliff	Benthos, Inc.
B. Reckert	U. S. Geological Survey, Washington
T. Sackton	Observer, Mass. Fair Share
W. Strahle	U. S. Geological Survey
D. Twichell	" " "
J. West	" " "

Equipment:

Navigation: Loran C (Northstar 6000)

Depth : Hydro Products precision gift recorder

Conductivity-temperature-depth-transmission-oxygen: Neil Brown Inst. Systems
CTD-DD, with Montedero-Whitney Transmissometer

Objectives:

The objectives of the AII cruise were to:

1. Deploy 5 bottom tripod systems and 6 current moorings and recover two tripods and 2 current moorings as part of a continuing study of currents and sediment transport on the east coast continental shelf. The specific objective of this array was to monitor near bottom circulation along the southern flank of Georges Bank and through the Great South Channel, and to investigate the coherence of flow between the Georges Bank and mid-Atlantic region of the shelf. We also wish to study the currents and

processes of sediment movement in the region of fine grained sediments south of Martha's Vineyard.

2. Conduct hydrographic observations of temperature salinity and suspended matter along selected cross-shelf and along shelf sections to determine the position of the instrument moorings with respect to the coastal water masses to aid in interpretation of tripod and current meter data.
3. Conduct short side-scan sonar surveys to determine large scale bedform distribution (sand waves, megaripples, etc.) and if possible, the direction of sediment movement associated with these bedforms.
4. Recover, relight and replace as necessary surface marker floats at tripod and current meter locations. The floats mark the instrument locations so that fishermen can avoid fouling their nets and keep the instrumentation undisturbed.

Narrative:

- 28 Sept. 1030 Depart Woods Hole; XBT observations.
- 29 Sept. 0230 Arrive Georges Bank Station M. Deploy 2 surface marker buoys; deploy subsurface current mooring 164.
0700 Complete mooring deployment. Underway across crest of Georges Bank to Station L.
- 2130 Arrive Georges Bank Station L. Deploy 2 surface marker buoys; deploy subsurface current mooring 163.
- 30 Sept. 0100 Complete mooring 163. Underway across southeast flank of Georges Bank, CTD and XBT observations.
- 1200 Arrive Georges Bank Station K. Deploy surface marker buoy; recover surface marker buoy; redeploy surface marker buoy.
- 1550 Deploy tripod mooring 156; deploy subsurface current mooring 161. Obtain bottom grab sample.
- 2000 Commence side-scan survey around mooring Station K.
- 2400 Complete side-scan survey.

- 1 Oct. 0300 Arrive Georges Bank Station A (long term station). Obtain bottom grab sample.
- 0600 Recover tripod mooring 149.
- 0900 Recover current mooring 151; replace one surface marker buoy.
- 1545 Deploy tripod mooring 155.
- 1645 Deploy current mooring 160.
- 1700 Complete mooring work at Station A. Continue cross-shelf hydrographic transect.
- 2200 Complete cross-shelf hydrographic transect. CTD wire snagged in drum. Retermine.
- 2 Oct. 0900 Underway south of Nantucket. XBT and CTD observations. Arrive mooring Station P ('mud patch'). Deploy surface marker buoy.
- 1518 Deploy current mooring 162.
- 3 Oct. CTD and XBT observations along New Jersey Shelf.
- 1400 At mooring Station D. Deploy surface marker buoy.
- 1500 Deploy tripod mooring 159.
- 1600 Start side-scan sonar survey.
- 1900 Side-scan fouled in submerged wreck NW of mooring Station D. Tow cable parted at fish, towing post severely bent. Recovered fish with safety line. Underway to mooring Station B.
- 4 Oct. 0032 Recover current meter mooring 150.
- 0150 Recover tripod mooring 148. Await daylight for surface buoy recovery.
- 0700 Recover surface buoy with VACM.
- 0800 Deploy surface buoy with VACM (mooring 165).
- 0918 Deploy tripod mooring 158; deploy subsurface current mooring 165.
- 1000 Underway to complete cross-shelf hydrographic transect.
- 1300 Complete New Jersey cross-shelf transect.

5 Oct. 0330 Start cross-shelf hydrographic transect south of Martha's Vineyard (across 'mud patch').
0900 Deploy tripod mooring 157 at Station P. Underway to complete cross-shelf hydrographic section.
1900 Arrive WHOI pier.

Instrument Performance (Preliminary):

Mooring 148 (Tripod, MA B)

Tripod moved by fishermen after approximately 3 weeks.

Current record failed (rotor and vane broken after fishing incident).

Transmissometer record approximately 1 month.

Camera record approximately 2 months.

Pressure, temperature, full record.

Mooring 149 (Tripod, GB A)

Camera record 7 days duration - connector failure in strobe.

Current, pressure, temperature, transmission record 3 months.

Mooring 150 (Current Mooring, MA B)

Upper VACM

rotor out of bearings at recovery; possibly moved by fishermen; data not processed as yet

Lower VACM - transmissometer

rotor out of bearings at recovery; possibly moved by fishermen; bad splice in transmissometer cable

Mooring 151 (Current Mooring, MA A)

Upper VACM - data O.K.

Mid VACM - 1/2 tape

Lower VACM - data O.K.

Tabulated Information:

a. Days at Sea: 8

b. Instrumentation Recovered: (see Figures 1 and 2)

<u>Area</u>	<u>Type</u>	<u>Mooring</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Station</u>
MA	T	148	38°43'N	73°37'W	B
GB	T	149	40°51'N	67°24'W	A
MA	cm(2)	150	38°43'N	73°37'W	B
GB	cm(3)	151	40°51'N	67°24'W	A

c. Instrumentation Deployed: (see Figures 1 and 2)

<u>Area</u>	<u>Type</u>	<u>Mooring</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Station</u>
GB	T	155	40°51'N	67°24'W	A
GB	T	156	41°02'N	67°34'W	K
GB	T	157	40°29'N	70°30'W	P
MA	T	158	38°43'N	73°37'W	B
MA	T	159	39°59'N	74°02'W	D
GB	cm(2)	160	40°51'N	67°24'W	A
GB	cm(2)	161	41°02'N	67°33'W	K
GB	cm(1)	162	40°29'N	70°30'W	P
GB	cm(1)	163	41°42'N	66°36'W	L
GB	cm(1)	164	40°51'N	68°48'W	M
MA	cm(2)	165	38°43'N	67°24'W	B

d. Stations

XBT 61

CTD/transmission 33

Surface salinity 91

Surface grab samples (Stations 4727-4733) 7

Side-scan sonar ~ 10 nm

Figure 1. Location of moorings deployed and recovered on ATLANTIS II 103. Tripods deployed at Stations A, K, and P. Current moorings deployed at Stations A, K, L, M, and P. Tripod and current mooring recovered at Station A.

Figure 1

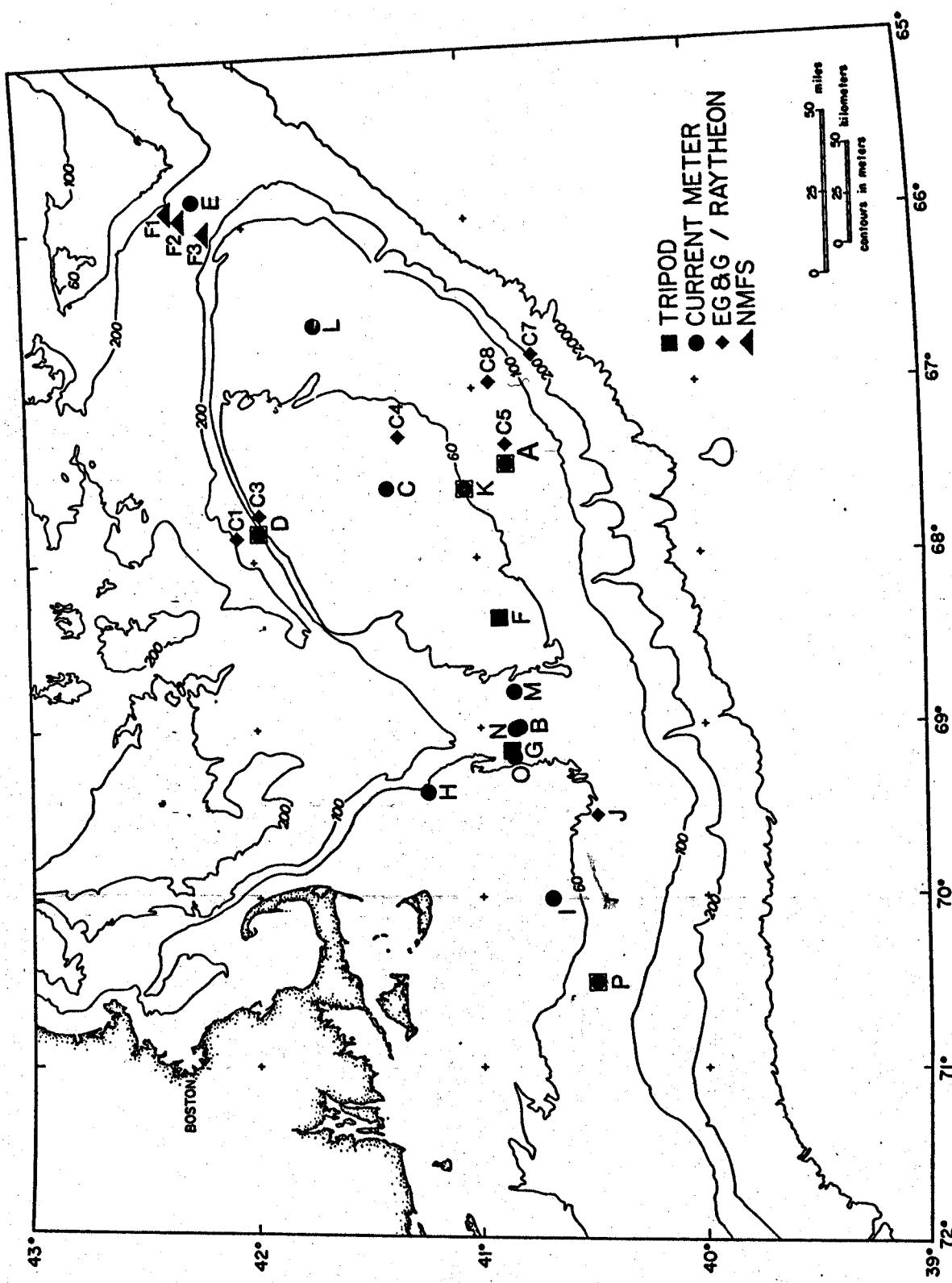


Figure 2. Location of moorings deployed and recovered on ATLANTIS II 103. Tripods deployed at Stations B and D. Current mooring deployed at Station B. Tripod and current mooring recovered at Station B.

Figure 2

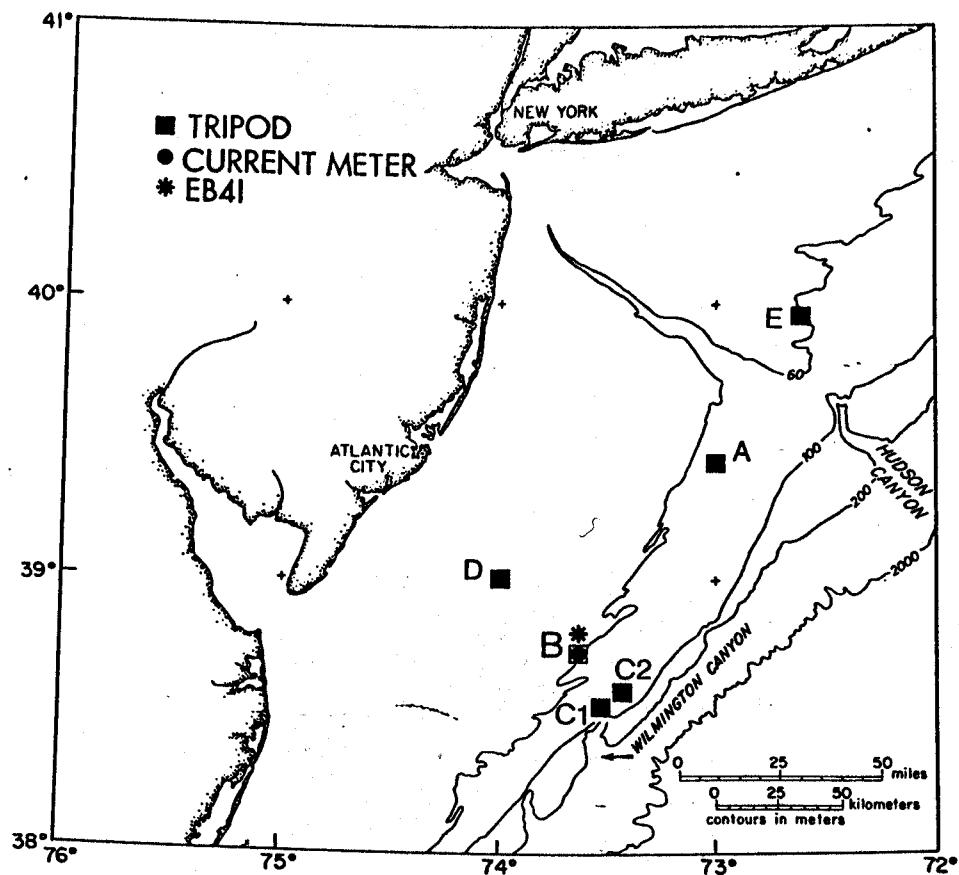


Figure 3a. Cruise track of ATLANTIS II 103, Georges Bank.

Figure 3b. Cruise track of ATLANTIS II 103, Mid-Atlantic Shelf.

Figure 3a.

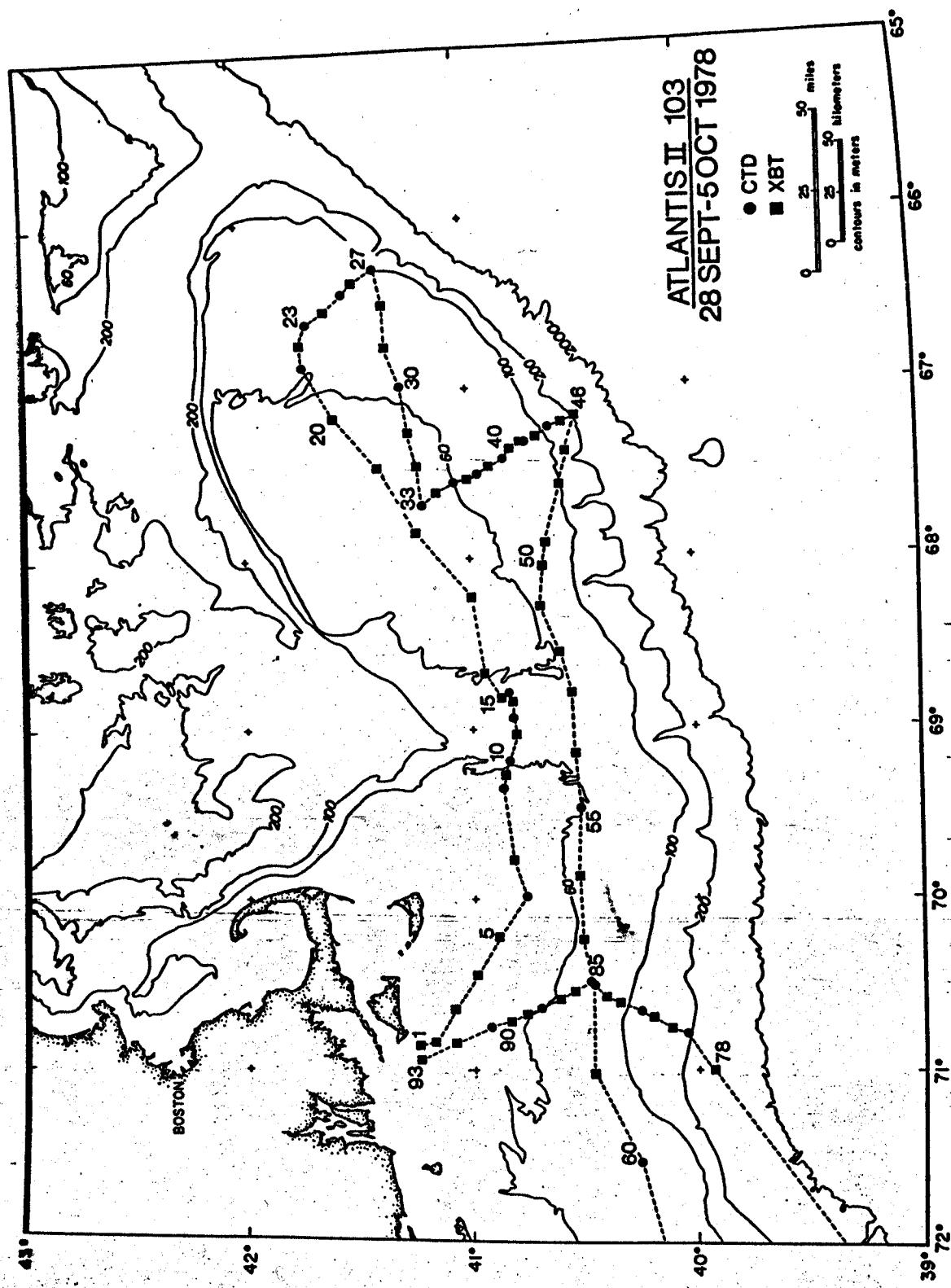
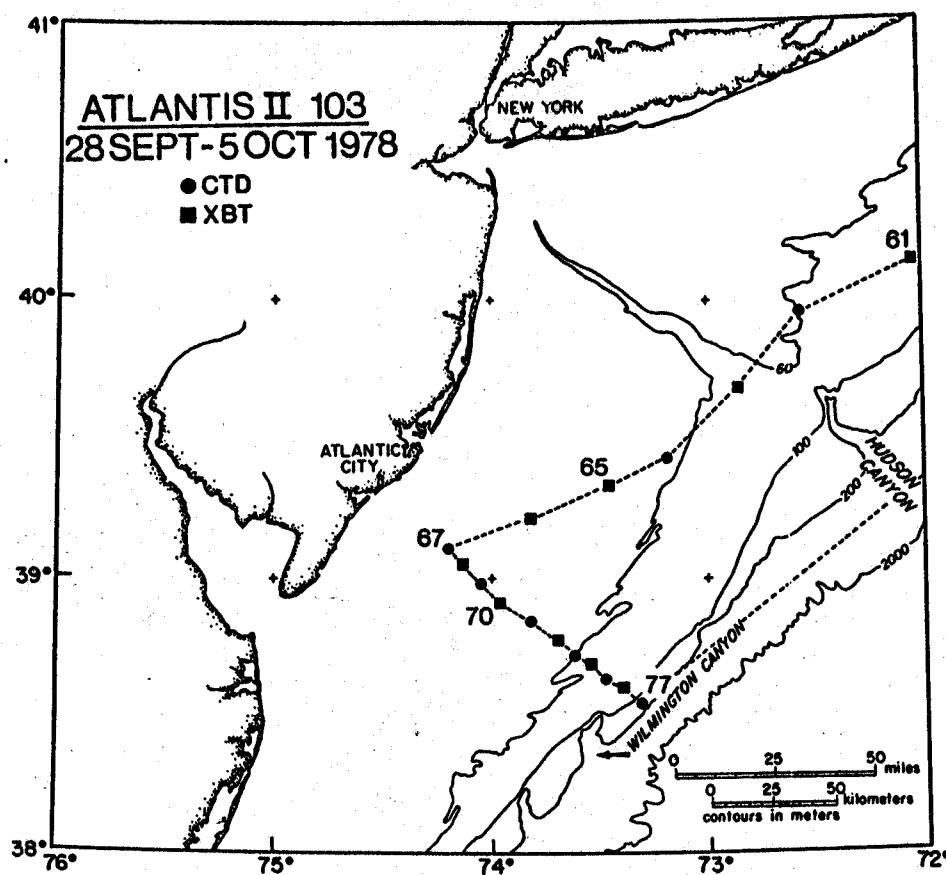
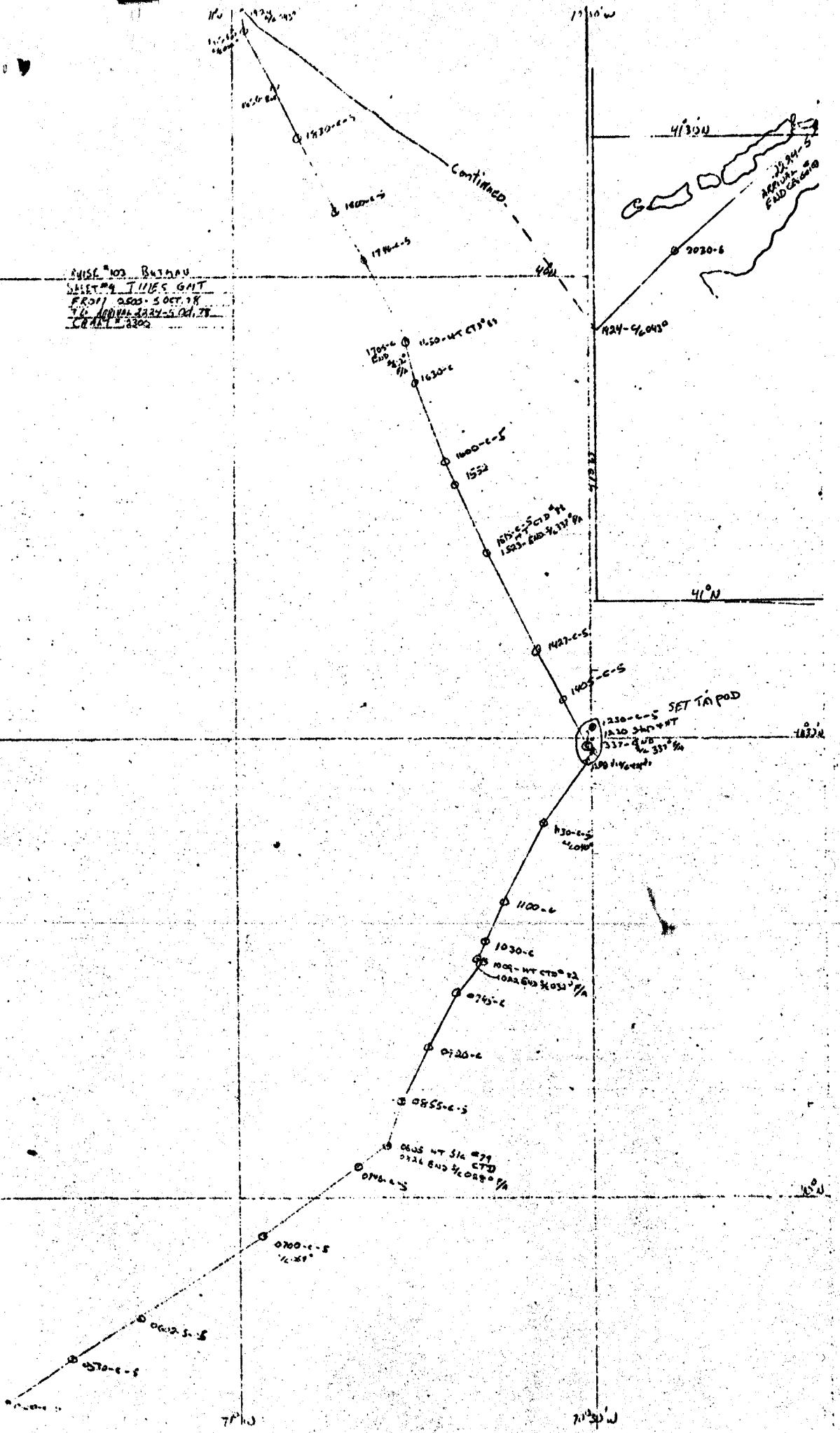


Figure 3b.



BUISSE #103 BU33AU
SELECT #4 T 1115S GMT
FROM 0500 - 5 OCT. 78
TO 0000 3324-5 OCT. 78
CIRCUIT #3302



APPENDIX I
AII 103 Station List

Table I
 Station List
 Atlantis II 103
 28 Sept. - 5 Oct. 1978

Sta.#	Date	Time	Depth (m)	Latitude	Longitude	XBT	Suspended Sediment and CTD	Surface Salinity
1	9/28	1230	23	41°15.3'N	70°52.4'W	X		X
2		1257	27	41°11.4'N	70°51.0'W	X		X
3		1401	45	41°05.7'N	70°39.2'W	X		X
4		1507	42	40°59.9'N	70°27.0'W	X		X
5		1620	37	40°53.8'N	70°13.6'W	X		X
6		1753	27	40°46.4'N	69°59.7'W		X	X
7		1916	35	40°49.9'N	69°46.6'W	X		X
8		2113	42	40°52.9'N	69°21.1'W		X	
9		2206	51	40°51.8'N	69°16.9'W	X		X
10		2300	67	40°50.2'N	69°12.0'W		X	X
11	9/29	0007	78	40°48.8'N	69°02.8'W	X		X
12		0102	71	40°49.4'N	68°56.7'W		X	X
13		0210	70	40°49.4'N	68°50.8'W	X		X
14		0244	64	40°49.4'N	68°47.0'W		X	X
15		0653	69	40°51.7'N	68°48.7'W	X		X
16		0753	58	40°57.0'N	68°40.4'W	X		X
17		1021	55	41°00.3'N	68°14.5'W	X		X
18		1256	41	41°14.2'N	67°50.1'W	X		X
19		1506	40	41°24.5'N	67°27.1'W	X		X
20		1658	54	41°35.4'N	67°09.3'W	X		X
21		1900	66	41°36.2'N	66°44.6'W		X	X
22		2000	63	41°37.5'N	66°37.0'W	X		X
23		2117	65	41°42.2'N	66°36.2'W		X	X
24	9/30	0110	78	41°37.7'N	66°31.4'W	X		X

Appendix I (continued)

Table I - Station List

Sta.#	Date	Time	Depth (m)	Latitude	Longitude	XBT	Suspended Sediment and CTD	Surface Salinity
25		0145	88	41°32.9'N	66°25.9'W		X	X
26		0235	90	41°29.3'N	66°21.5'W	X		X
27		0314	96	41°24.9'N	66°16.3'W		X	X
28		0431	91	41°21.9'N	66°29.6'W	X		X
29		0531	77	41°21.2'N	66°44.3'W	X		X
30		0630	67	41°17.9'N	66°58.8'W		X	X
31		0800	56	41°15.4'N	67°15.1'W	X		X
32		0900	47	41°13.7'N	67°27.6'W	X		X
33		1020	50	41°12.5'N	67°41.1'W		X	X
34		1110	54	41°08.4'N	67°37.2'W	X		X
35		1145	61	41°03.4'N	67°33.9'W		X	X
36	10/1	0035	66	41°00.1'N	67°32.6'W	X		X
37		0120	71	40°57.3'N	67°30.1'W		X	X
38		0205	79	40°54.4'N	67°27.9'W	X		X
39		0230	86	40°50.9'N	67°25.3'W		X	X
40		1654	86	40°48.8'N	67°21.6'W	X		X
41		1728	91	40°45.8'N	67°19.8'W	X		X
42		1816	97	40°44.4'N	67°19.5'W		X	X
43		1901	97	40°41.4'N	67°17.7'W	X		X
44		1959	107	40°38.0'N	67°15.1'W		X	X
45		2030	133	40°34.6'N	67°12.4'W	X		X
46		2123	219	40°30.6'N	67°10.1'W	X	X	X
47		2300	111	40°33.6'N	67°22.4'W	X		X
48		2355	97	40°35.8'N	67°34.9'W	X		X

Appendix I (continued)

Table I - Station List

Sta.#	Date	Time	Depth (m)	Latitude	Longitude	XBT	Suspended Sediment and CTD	Surface Salinity
49	10/2	0130	86	40°39.0'N	67°55.0'W	X		X
50		0200	85	40°39.8'N	68°02.9'W	X		X
51		0305	70	40°41.2'N	68°17.2'W	X		X
52		0419	66	40°36.6'N	68°33.5'W	X		X
53		0520	68	40°33.6'N	68°47.9'W	X		X
54		0656	73	40°32.9'N	69°09.0'W	X		X
55		0820	59	40°31.5'N	69°28.4'W		X	X
56		1047	67	40°32.1'N	69°52.4'W	X		X
57		1223	62	40°31.2'N	70°14.1'W	X		X
58		1335	70	40°28.8'N	70°30.2'W		X	X
59		1801	82	40°27.4'N	71°02.0'W	X		X
60		2049	86	40°15.5'N	71°33.3'W		X	X
61		2338	70	40°08.2'N	72°01.5'W	X		X
62	10/3	0230	61	39°56.7'N	72°34.1'W		X	X
63		0450	67	39°40.4'N	72°51.9'W	X		X
64		0657	59	39°24.7'N	73°11.8'W		X	X
65		0835	48	39°19.1'N	73°27.6'W	X		X
66		1038	42	39°12.8'N	73°49.1'W	X		X
67		1220	28	39°05.2'N	74°11.1'W		X	X
68		1315	36	39°02.2'N	74°07.2'W	X		X
69		1402	42	38°58.7'N	74°02.2'W		X	
70		2015	42	38°54.6'N	73°57.5'W	X		X
71		2100	47	38°50.6'N	70°49.9'W		X	X
72		2210	50	38°46.7'N	73°41.1'W	X		X
73		2300	60				X	X

Appendix I (continued)

Table I - Station List

Sta.#	Date	Time	Depth (m)	Latitude	Longitude	XBT	Suspended Sediment and CTD	Surface Salinity
74	10/4	1030	66	38°40.5'N	73°32.7'W	X		X
75		1100	74	38°37.4'N	73°28.1'W		X	X
76		1155	86	38°35.1'N	73°23.9'W	X		X
77		1246	132	38°32.0'N	73°18.2'W		X	X
78	10/5	0330	455	39°56.5'N	71°00.0'W	X		X
79		0405	157	40°03.5'N	70°48.2'W		X	X
80		0502	135	40°07.5'N	70°46.1'W	X		X
81		0536	125	40°12.3'N	70°42.9'W	X		X
82		0621	117	40°15.7'N	70°40.2'W		X	X
83		0705	96	40°21.2'N	70°37.1'W	X		X
84		0735	83	40°25.0'N	70°35.3'W	X		X
85		0810	72	40°29.2'N	70°30.8'W		X	X
86		1015	66	40°33.2'N	70°33.4'W	X		X
87		1035	64	40°37.3'N	70°36.0'W	X		X
88		1110	61	40°42.2'N	70°39.3'W		X	X
89		1155	60	40°46.2'N	70°41.6'W	X		X
90		1220	54	40°51.0'N	70°43.9'W	X		X
91		1255	51	40°56.0'N	70°45.9'W		X	X
92		1410	37	41°05.0'N	70°51.9'W	X		X
93		1502	40	41°14.5'N	70°57.9'W	X		X

Table II

Surface Grab Samples
Atlantis II 103
28 Sept. - 5 Oct. 1978

<u>Sta. #</u>	<u>Date</u>	<u>Depth (m)</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Current Mooring</u>
4727	30 Sept.	55	41°02.2'N	67°33.4'W	GB K
4728	1 Oct.	85	40°51.1'N	67°27.2'W	GB A
4729	1 Oct.	85	40°51.1'N	67°27.2'W	GB A
4730	1 Oct.	85	40°48.1'N	67°22.4'W	GB A
4731	30 Oct.	42	38°58.6'N	74°02.6'W	MA D
4732	3 Oct.	61	38°43.5'N	73°37.0'W	MA B

APPENDIX II
AII 103 Bridge Log

Cruise No. 103

Cruise No. 103

R/V ATLANTIS II DECK LOG

Date 28 SEPT 19

From *Libra*

Time Zone - +4

44

1

R/V ALLANIS DECK LOG

Cruise No. 103

DUNORRITY SECT. 29th 1978 From Woods Hole to Woods Hole

Time Zones 44

is held in Woods Hole

DRAFTING SCOTT

1st Officer

Master

243

Cruise No. 103

R/V ATLANTIS II DECK LOG

Day
3

R/V ATLANTIS II DECK LOG

Cruise No. 103

Date Oct 20, 1978 From Woods Hole to Woods Hole

Time Zone +4

Pst. Hour	Course Lat. Long.	Compass Stnd.	True	Dist. Mile	Speed Kts.	Dir.	Air	Water	Station			TIME END	
									No.	Lat.	Long.		
1 0022	96° 14' S (161° 41')								0012 COMPLETE STA "K" 96° 14' S (161° 41')	13	60° 32' S	62° 30' E	0115
2									0015 STOPPED "HT" FOR STA "K" 96° 14' S (161° 41')	13	60° 32' S	62° 30' E	0138
3									0135 COMPLETE STA "K" 96° 14' S (161° 41')	14	35° 24' S	62° 45' E	0245
4	" HT "	ENR							0145 STOPPED "HT" AT 300' SITE	14	45° 20' S	62° 46' E	0245
5									RECOVER TRAPDOOR. 0630 COMMENCED SEARCH-	14	40° 57' S	62° 52' E	0352
6									0650 ADDED ON 0715 AND DERT. LYING TO.	11	40° 51' S	62° 54' E	0350
7									CPT 4030 67° 10' 2114	14	40° 51' S	62° 54' E	0355
8	14T		3 - 3020 63						CPT 4030 67° 10' 2114	14	40° 51' S	62° 54' E	0355
9									0810-0913 = MAN OVERBOARD TO PICK UP				
10									UNDERWATER RELEASED BAG - 0912 HAD ONE.				
11									0930-1045 = MAN TO PICK UP BODY "M"				
12	-VHR -	3 2 / 3025 67	0	VIS GOOD 1115 - 1145 KEYING IN POSITION. PIGS					POSITIONS				
13	1330-1530	FIN CATCHED		1400 AND AFTER RELEASING PIGS TOWED BACK					Latitude				
14	1400	CIR CATCHED		1500 HAD ONE ON BOARD					Latitude				
15	All	IN GOOD ORDER PER C		1450 - 1500 - 1510 ON SURFACE BLOW					Longitude				
16	VHR	3 2 / 3018 72	C	Good VTS,					Longitude				
17				1600 COLLECTING BOTTOM SAMPLES, 1610 4/4/78					Orientation				
18				1610-1620 SURFACE CURRENT MTR. 1640-1645 4/4/78					Arrival				
19				1620-1630 CHANCELLOR STA "A" SET ON 150° 1900 57° 42'					Arrival				
20	VHR	3 2 / 3007 73	C	1635 COMPLETE STA "K" 96° 14' S (161° 41')					Arrival				
21	2057	96° 16' 00	4 / 3100 47	ON 160° FOR CTD 4/4/78					Arrival				
22				2114 47 FOR CTD 4/4/78					Arrival				
23				2145 CTD 4/4/78,					Arrival				
24	3000 284°	4 / 3004 72	M	VIS GOOD TO FAIR					Arrival				
	2240	77210	17	WEATHER Q5					Arrival				
			20	WEATHER Q5					Arrival				
				Length of day 24 hr					Arrival				
				At Sea 03 01 34 min					Arrival				

Master

1st Officer

NO.

26
3

R/V ATLANTIS II DECK LOG

Cruise No. 03

Date Available October 2nd, 1978 From Woods Hole Words Hole

Time Zone +4

Hour	Pmt Log	Course	Stand	Speed Knots	Speed Knots	Bear.	Air	Water Weather	Remarks	TIME		
										Station	No.	Loc. (Lat. & Long.)
1										CTD	40° 36' N	28° 00' E
2										#47	40° 36' N	28° 00' E
3	0310	C/C 2520G	NW	2	1	E215N	64			CTD	40° 29' N	133° 58' E
4	269	255								#48	40° 29' N	70° 30' E
5										SURFACE		
6										BUSY	40° 02' N	70° 30' E
7										BUSY	40° 02' N	133° 58' E
8	273	260	MNE	5	3	SSE	61	C	STOPPED "H"	40° 29' N	70° 30' E	
9	0815	2							POWERS SURFACE BUOY	40° 29' N	133° 58' E	
10										40° 29' N	70° 30' E	
11										40° 29' N	133° 58' E	
12	283	369	N	2	2	2994	60	F	VIS POOR RADAR WATCH	40° 29' N	70° 30' E	
13									STOPPED "H"	40° 29' N	70° 30' E	
14									DOWN ON SURFACE BUOY	40° 29' N	133° 58' E	
15									POWER ON SURFACE BUOY	40° 29' N	70° 30' E	
16									1519 COMPLETED STA. #48 - BUOY STA. #49	40° 29' N	70° 30' E	
17									RAPAR	40° 32' N	133° 58' E	
18									L.A.M. 1200 C	40° 31' N	133° 58' E	
19									1200 S	40° 31' N	133° 58' E	
20									1200 P.M. 1630	40° 28' 27.7	52' S 133° 58' E	
21									2000 "Q" 1630	40° 28' 27.7	52' S 133° 58' E	
22									1630 1520	40° 18' N	133° 58' E	
23									1520 1500	40° 18' N	133° 58' E	
24									1500 3400	40° 06' N	133° 58' E	
										Arrived		
										Steaming Time	17 hr 30 min	
										Station Time Total	6 hr 30 min	
										Day's Run	164.5 miles	
										Total	527 miles	
										Ave. Speed	9.4 knots	
										Overall Total Dist.	255571.6 mi	
										Length of Day 24 hr		
										at 800 04700 m 34		

Date Tuesday October 3^r, 1978 From Woods Hole to Woods Hole

Time Zone +4

1st Officer

Master

R/V ATLANTIS II DECK LOG

Cruise No. 103

Date: //

Date/WEDNESDAY, OCTOBER 4th, 1972 from Woods Hole to Woods Hole Time Zone +4

Time Zone +7														
Pkt No.	Pkt Log	Course			Speed			Wind			Remarks	Station	Time	
		Steered	Straight	True	Spd	Dir	Spd	Dir	Airs	Water		No.	Loc.	N.J.
1											0032 Rock on current meter buoy	CTD	38°37'	73°45' S
2											0034 Current meter recovered & secured	CTD	38°37'	73°45' S
3											0140 Tripod surface float setted	CTD	38°37'	73°45' S
4	"44"	E	2	1	3012	63	60	dead	W15-		0150 Rock on tripod - 0110 tripod recovered	CTD	38°37'	73°45' S
5											0400 by line to in area till lighter ready			
6											To pick up buoy. 0615 maneuvered to pickup			
7											Buoy 0650 A/F Buoy 0704 Buoy clear.			
8	Yarong.	E	2	1	30.1270						0720-0953 started a current fl. @ white buoy			
9											Cape Davis.			
10											0953-140 C/126, 1050 S/139, -1056 XX, -1102 cm estd, -1115 W/ C/135°			
11														
12	134	E	2	1	3013	74	80	1/2 Good						
13	1420-1430 MAR. 0011 TRIP. FIT										1223 stopped 'H' FDR CTD STA #73			
14	1435% 0055 (00)										0310 complete STA #77 X 051° (062°H) H			
15														
16	1627 055	E	2	1	3014	73	6	dead	W15		0400 051° 38°34' S 73°38' E			
17											0445 051° 38°34' S 73°38' E			
18											1610 AS BG force			
19														
20	051	E	2	1	3014	72	C	dead vis all in apparent good order			1620 C 39°40.4' S 70°36' E			
21											Departure			
22											Arrival			
23	2315% 070	P/1445 TRIP. FIT	2	3320	4%	080	-	2220% 056°			Streaming Time	7'08"		
24	050	P/1445 TRIP. FIT	2-3	2	3019	70	4%	vis good			Station Time Total	16'452"		
											Day's Run	5.8 miles		
											Total	797.7 miles		
											Ave. Speed	51.3 knots		
											Grand Total Dist.	20542.3 mi		
											Length of Day 24hr			
											At Sea 0601" 34m			
3060														
											On Board	25		
											Per	20		

Cruise No. 103

Date TUESDAY OCTOBER 5th 1778 From Woods Hill to Woods Hole Time Zone -4

11 Officer

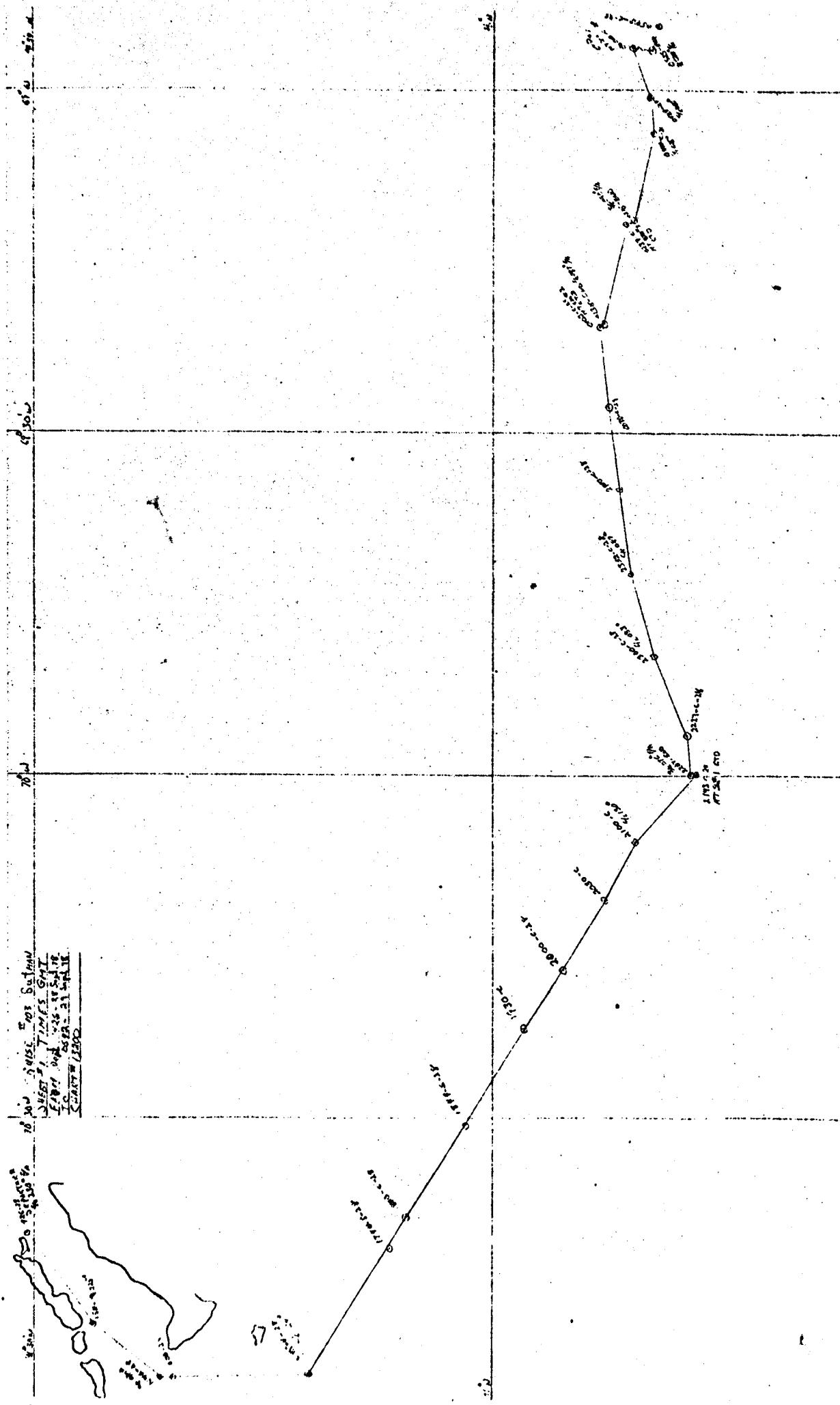
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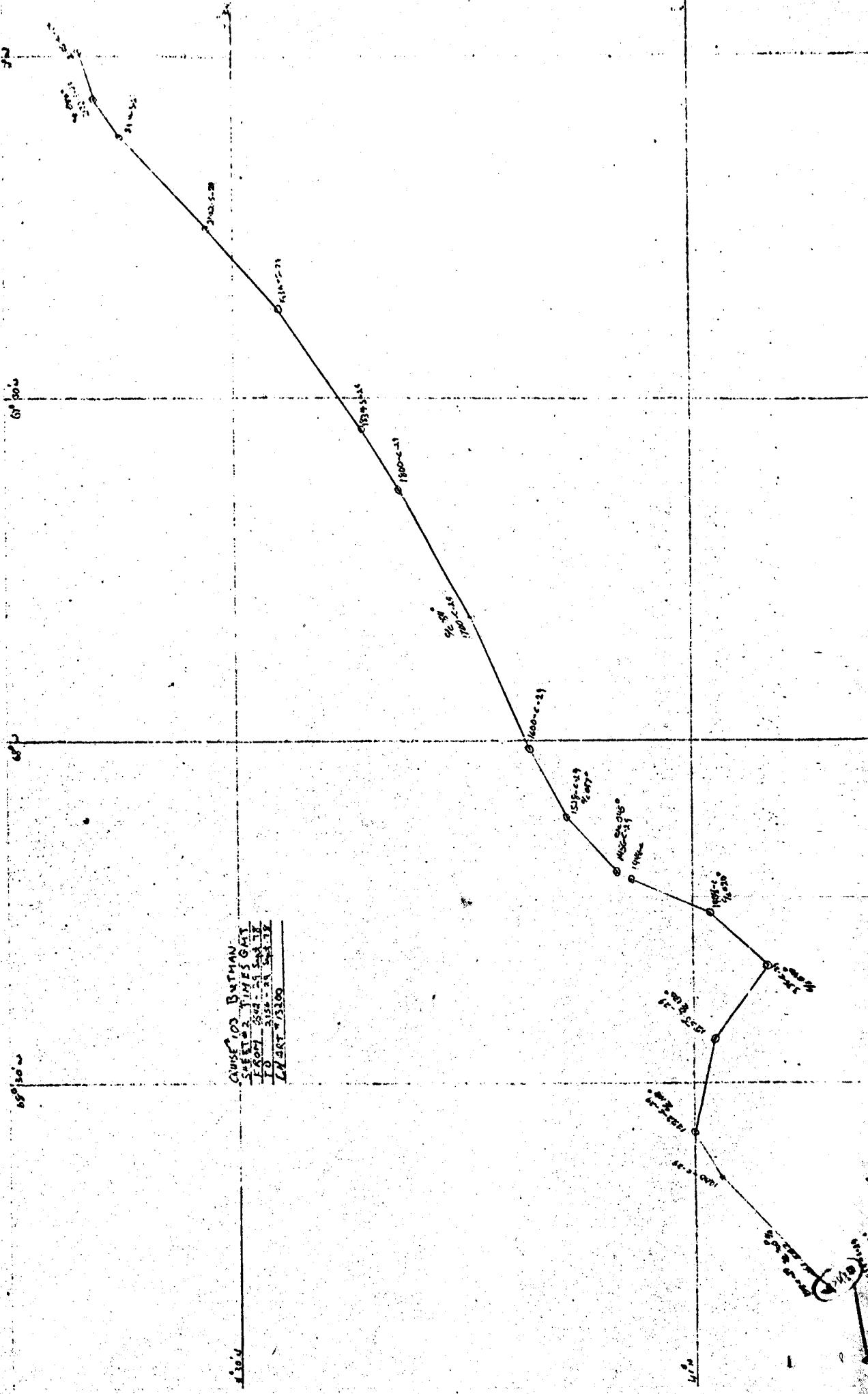
R/V ATLANTIS II DECK LOG

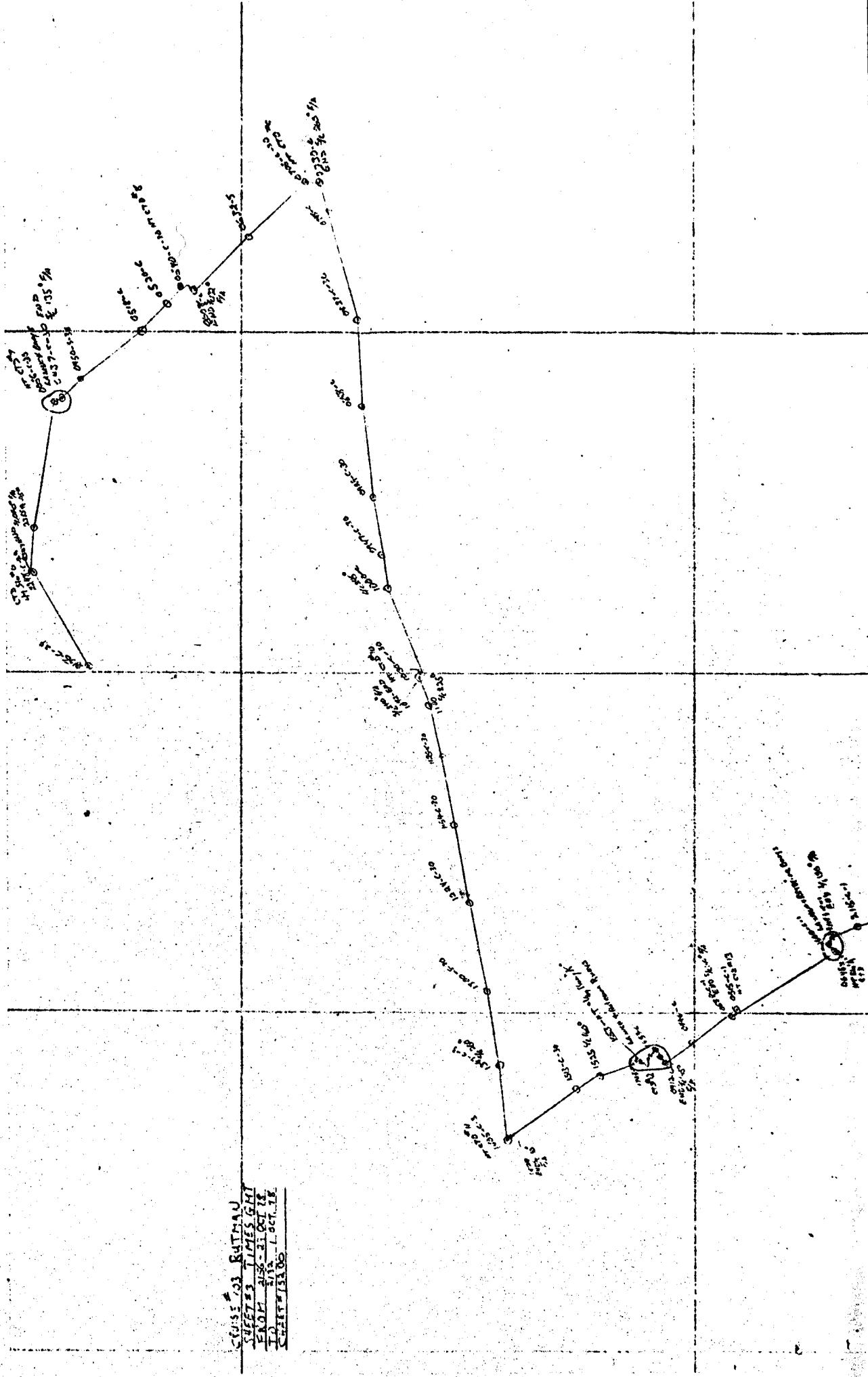
Date Friday Oct 6 1978 From

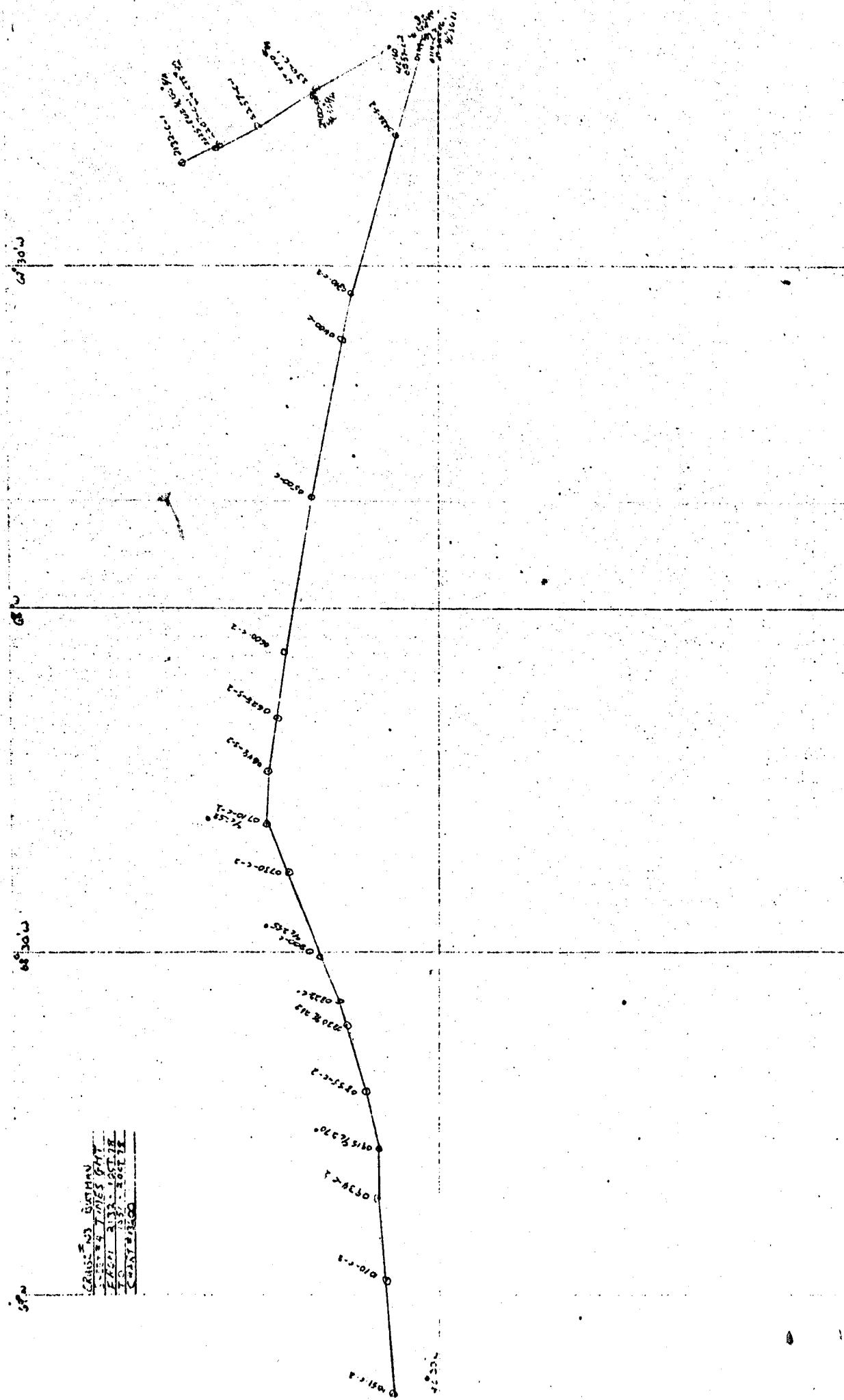
AT Woods Hole

APPENDIX III
AII 103 Smooth Sheets









CRUISE TO BUTMAN
PORT S. FORT
FROM 25 OCT 1943
TO 25 OCT 1943
CHARTERED

67301

20°

67302

65

CRUISE # 103 Butman
LEET = 6.714ES 6.14T
EAST = 2.130 - 2 Oct 18
WEST = 0.915 - 3 Oct 18
TOTAL = 9.765 - 5 Oct 18

783

